



DIY ACOUSTIC DIFFUSER DESIGNS

Fabrication Drawings for Optimized Stepped Diffuser A1-LF

ARQEN SONIC

A DIVISION OF WESTRIVER INDUSTRIAL INC.

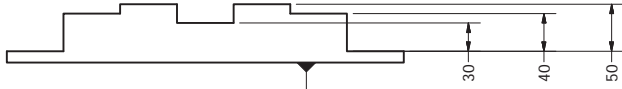
2012

Prepared by: Tim Perry

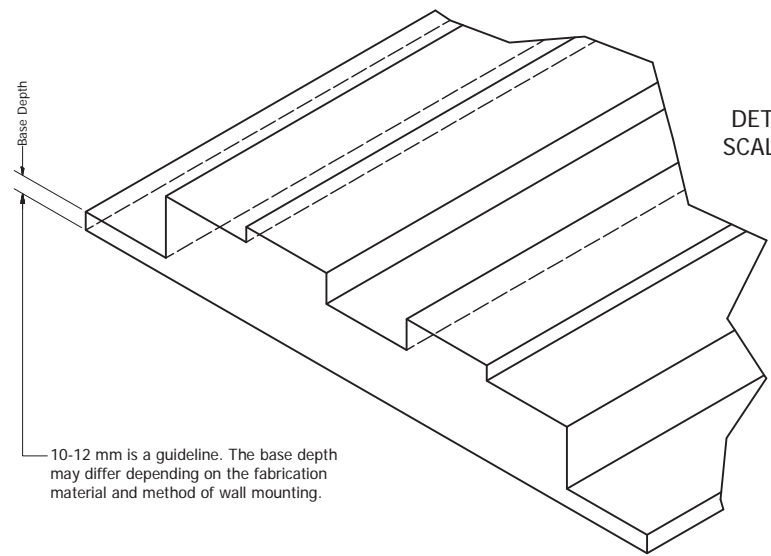
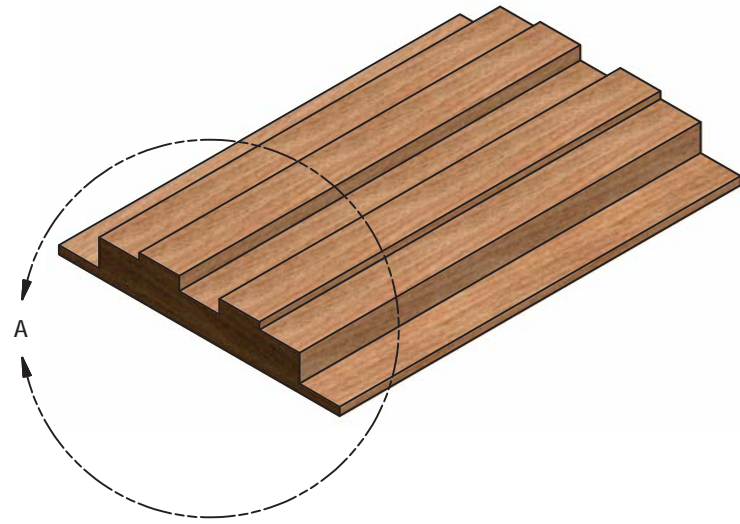
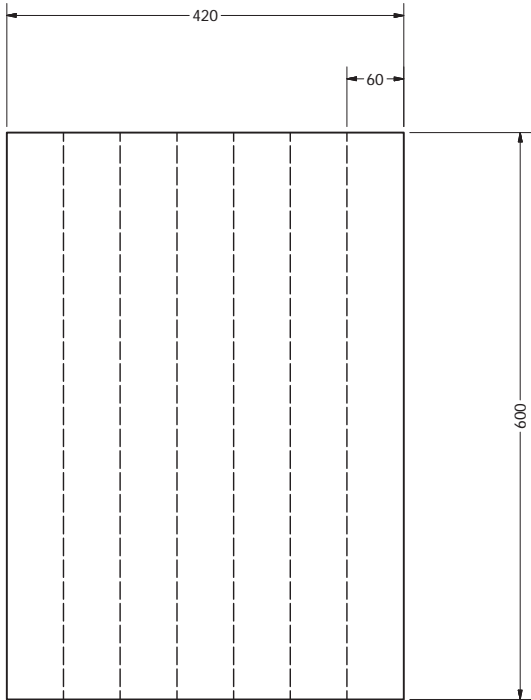


Stepped Diffuser Designs in Chapter 7.3 of “The Lean Optimization of Acoustic Diffusers” by [Tim Perry](#) are licensed under a [Creative Commons Attribution-NonCommercial 3.0 Unported License](#). Consult [RPG Diffusor Systems Inc.](#) for restrictions on fractal diffusers. Background research draws from the works of [Trevor Cox, University of Salford](#); [Peter D’Antonio, RPG Diffusor Systems Inc.](#)

The latest version of these drawings can be downloaded for free at
<http://Arqen.com/acoustics/>



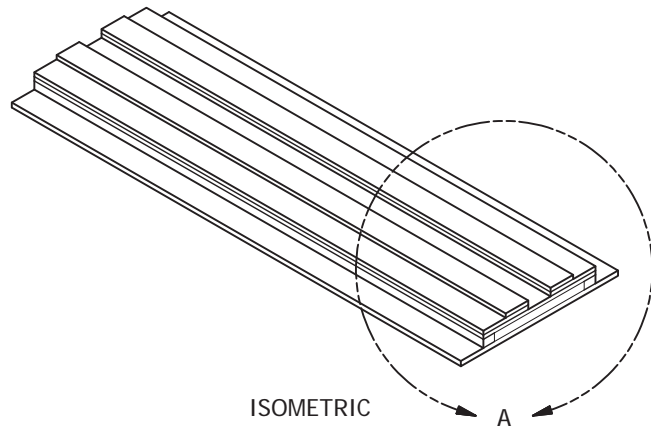
Seven 60 mm wide strips, or "steps".
 Step heights measured from the top of the base are {0, 40, 50, 30, 50, 40, 0} mm.
 Fabricate from acoustically reflective material such as wood or bamboo



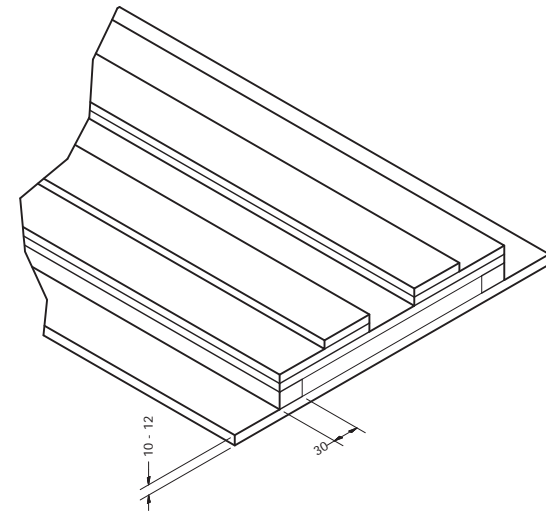
DETAIL A
 SCALE 1 / 2

10-12 mm is a guideline. The base depth may differ depending on the fabrication material and method of wall mounting.

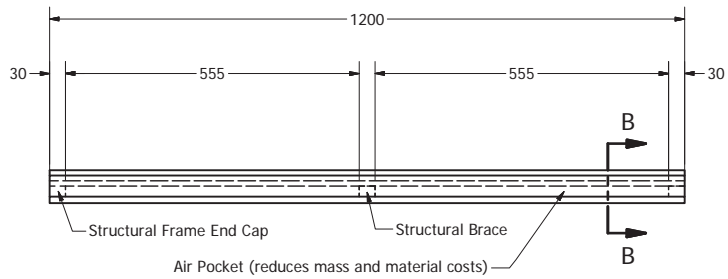
DRAWN Tim Perry	31/03/2012	Arqen		
CHECKED		TITLE		
QA		Lean Optimized Acoustic Diffuser Module		
MFG		A1-LF		
APPROVED		SIZE	DWG NO	REV
		C	DiffuserA1-LF-Fab	
		SCALE	SHEET 1 OF 1	



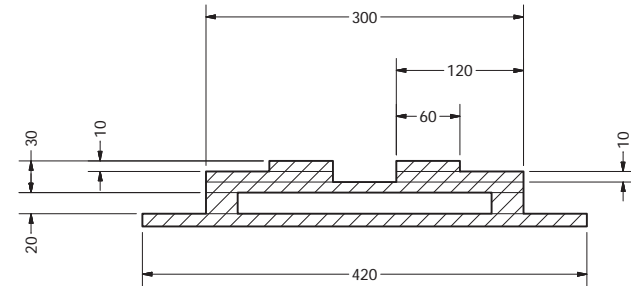
ISOMETRIC



DETAIL A
SCALE 0.28 : 1

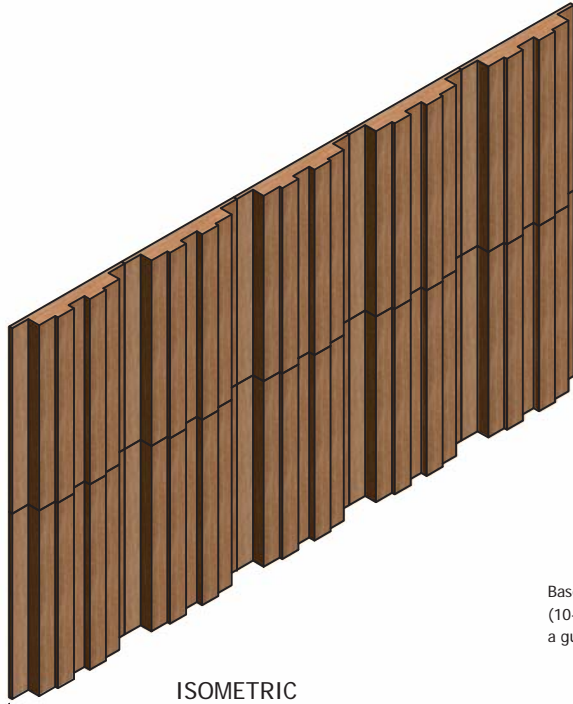


SIDE



SECTION B-B
SCALE 0.28:1

DRAWN Tim Perry	02/09/2012	Arqen	
CHECKED		TITLE	
QA		Optimized Acoustic Diffuser Module A1-LF Assembly (full height module)	
MFG		SIZE	DWG NO
APPROVED		C	DiffuserA1-LF-Fab-2-Tall
		SCALE	SHEET 1 OF 1
			REV



WALL-MOUNTING NOTES

Array assembly may vary depending on the height of each module*.

Modules may be heavy, depending on the construction material. Mount appropriately to support the weight of each module (Use a stud finder to choose locations for drilling into the wall).

To mount the array on a wall, attach modules to the wall one at a time. The simplest way to mount each unit is to pre-drill at the wall anchor points, then attach using wood screws.

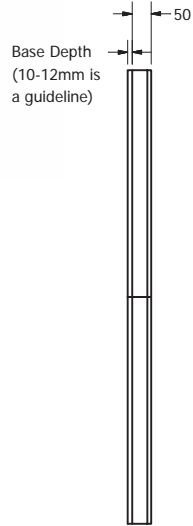
If wall stud spacing does not allow convenient mounting, attach a mount board to the wall studs (large enough to support the entire array). Then, attach the modules to the mount board.

***ARRAY ASSEMBLY OPTION 1:**

Create array by assembling 5 full-height diffuser modules. Each module is 1200 mm (4') high.

***ARRAY ASSEMBLY OPTION 2 (Shown):**

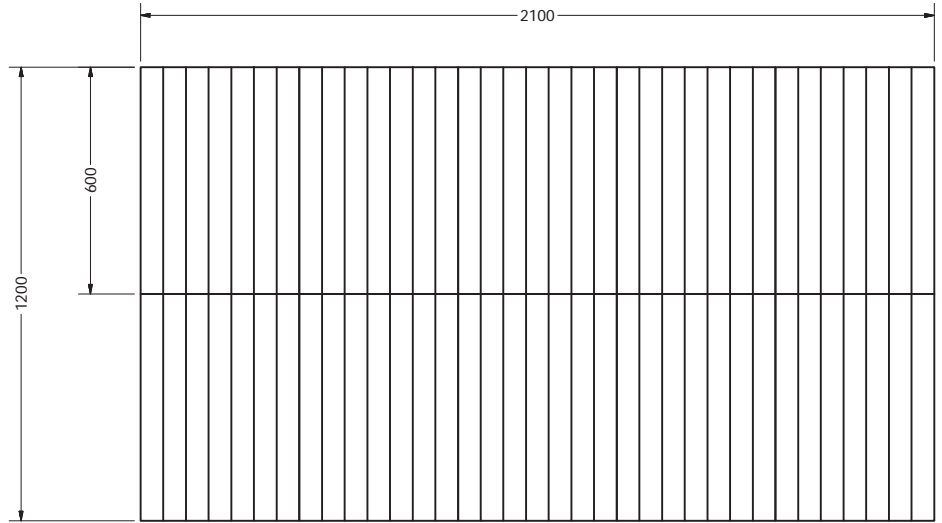
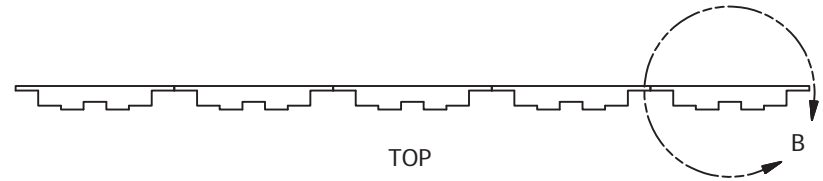
Create array by assembling 10 half-height diffuser modules. Each module is 600 mm (2') high.



SIDE



DETAIL B
SCALE 1 / 5

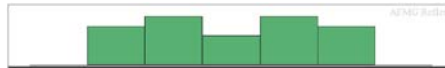


FRONT

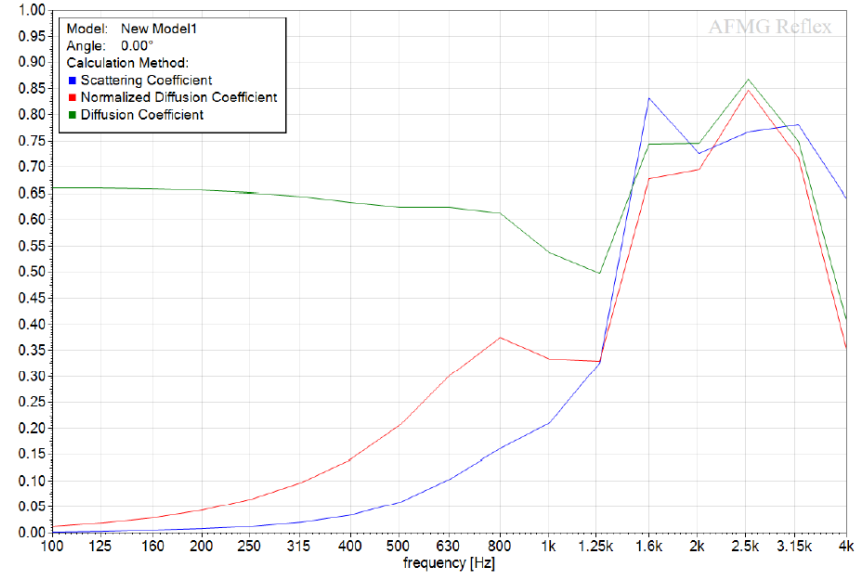
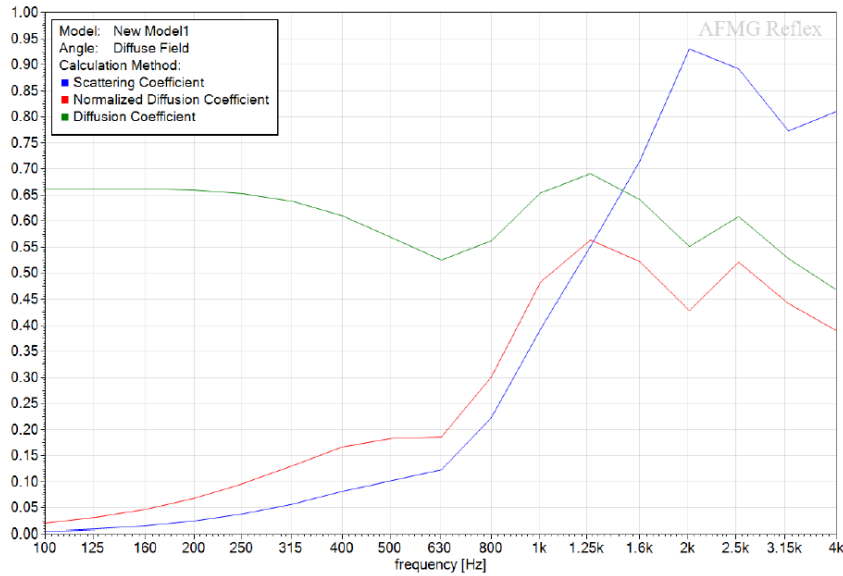
DRAWN Tim Perry	30/08/2012	Arqen		
CHECKED		TITLE		
QA		Modular Stepped Diffuser A1-LF Assembly (Array of Modules)		
MFG		SIZE	DWG NO	REV
APPROVED		C	DiffuserA1-LF-Fab-Array	
		SCALE	SHEET 1 OF 1	

Performance Coefficients for Single Module

Depth Profile of Diffuser Module (Simulation View in AFMG Reflex)



Performance Coefficients for Diffuser Module



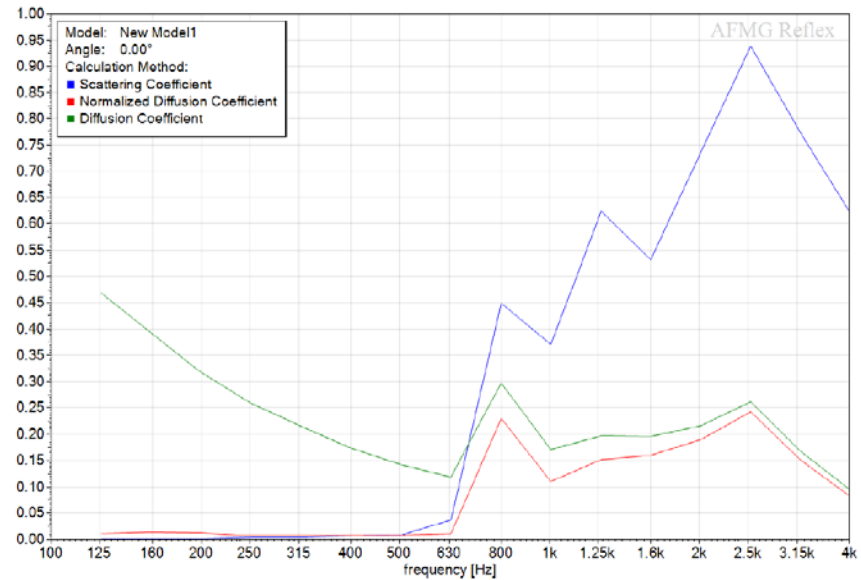
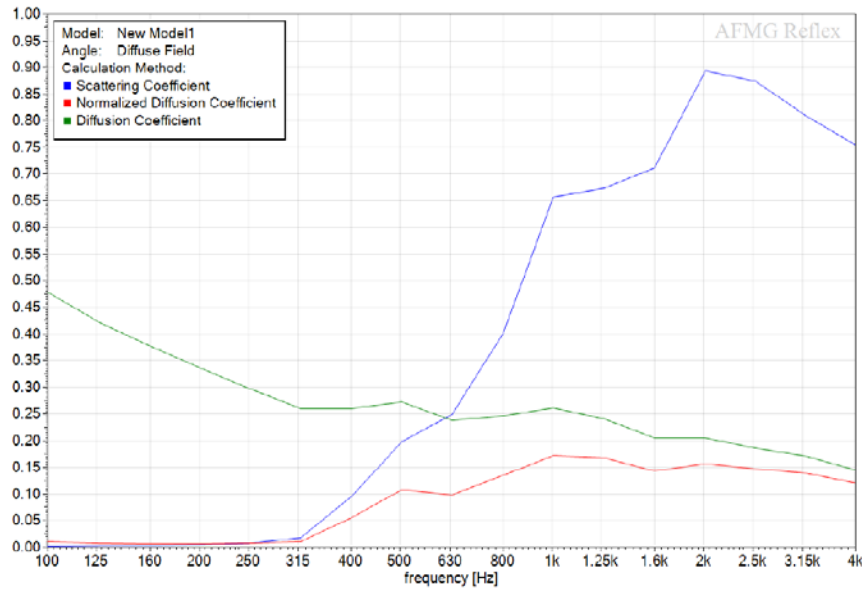
Visit <http://Argen.com/acoustics/> for updates and more designs.

Performance Coefficients for Periodic Array of 5 Modules

Depth Profile of Diffuser Array with No Profiled Modulation 1 (Simulation View in AFMG Reflex)



Performance Coefficients for Periodic Array of 5 Modules



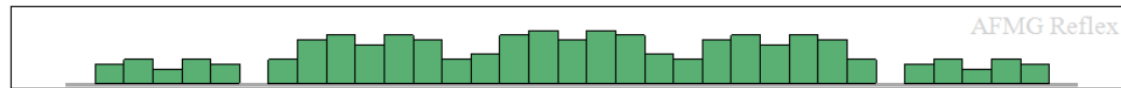
Visit <http://Argen.com/acoustics/> for updates and more designs.

Profiled Modulation 1: Mounting Modules to Prevent Periodicity

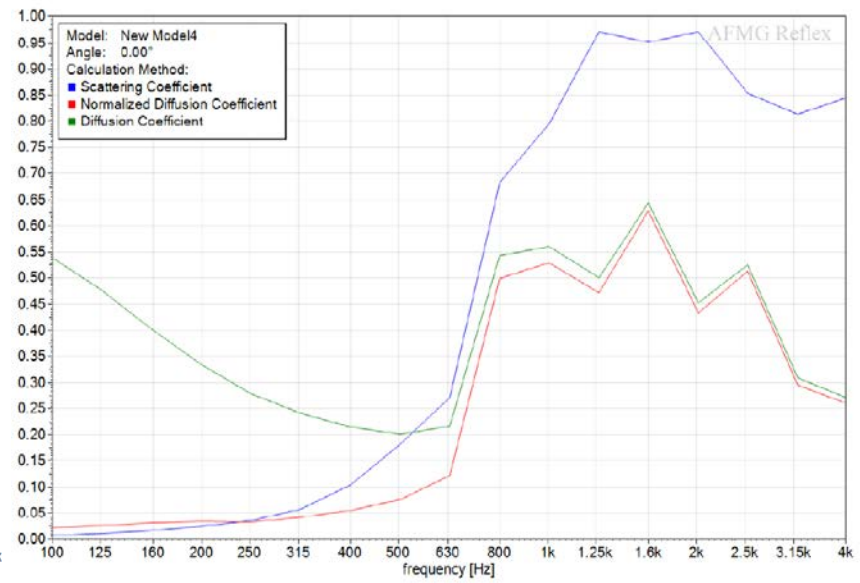
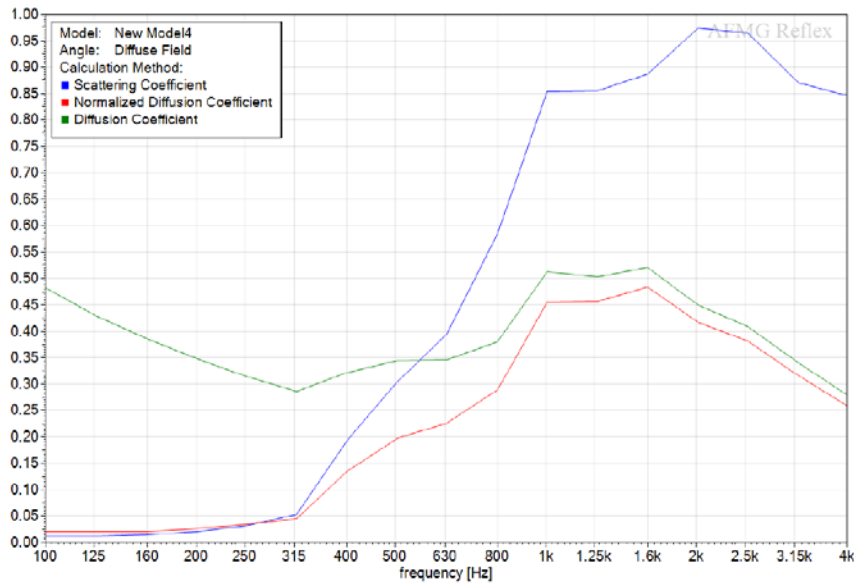
To reduce the effects of periodicity in the array, mount modules with varying depths as follows:

[0 cm, 5 cm, 6 cm, 5 cm, 0 cm]

Depth Profile of Diffuser Array with Profiled Modulation 1 (Simulation View in AFMG Reflex)



Performance Coefficients for Profiled Modulation 1



Visit <http://Argen.com/acoustics/> for updates and more designs.